REMARKS

Claims 10-11, 15, 25-26, 30-58, 62, and 66-82 remain pending in the application. Claims 15, 30, 73, and 75 have been amended without introduction of new matter. Favorable reconsideration is respectfully requested in view of the above amendments and the following remarks.

The allowance of claims 10-11, 25-26, 31-40, 41-58, 62, and 66-72 is again gratefully acknowledged.

Claims 15, 30, and 73-82 again stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Easton (USP 5,764,687) (henceforth "Easton") in view of Sih et al. (USP 6,608,858) (henceforth, "Sih"). This rejection is respectfully traversed.

In their response filed on October 24, 2007, Applicants explained how the combination of Easton and Sih at least lacks any teaching or suggestion of "provid[ing] at least two combined frequency error estimates, wherein: each of the combined frequency error estimates corresponds to a respectively different one of at least two base station transmitters." (Emphasis added.) By the phrase "corresponds to," Applicants defined a characteristic of the combined frequency error estimate. However, the Office's "Response to Arguments" makes it clear that the Office takes the phrase "corresponds to" as an indicator of how a generated signal is then to be applied, regardless of whether that signal inherently correspond to only one base station: "It is noted by examiner that in Fig. 7 of the Sih reference, the subtraction of a Rake finger frequency from the weighted average at the summer produces a combined value (combined frequency error estimate) that involves/requires/is associated with the use of the Rake finger frequency value in the summation calculation (each Rake finger frequency corresponds to a respective different one of the base station transmitters). In other words, each combined value/combined frequency error estimate involves or corresponds to the Rake finger frequency of each base station transmitter." (Emphasis added.)

To eliminate the multiple meanings of "corresponds to" as a point of disagreement, the claims have been re-worded to even more clearly express what had been previously defined by the claims. These amendments are discussed in the following.

As explained in Applicants' specification beginning at page 18, line 17, the problem of how to handle a frequency error between a local frequency reference of a receiver such as a mobile station and the carrier frequency of a transmitter is aggravated if the receiver receives signals from multiple transmitters at the same time, e.g., if a mobile station is communicating with more than one base station simultaneously, as in a soft handover

situation. This problem is addressed by handling (e.g., combining) received path rays from different base stations separately. This is useful because, by individually applying the AFC algorithms to each base station, the frequency offset between the mobile station and the base stations can be determined, thereby allowing a decision to be made as to what the final frequency offset should be. See, e.g., Applicants' specification at page 19, lines 9-22.

Independent claims 15, 30, 73, and 75 define embodiments that include this solution to the problem. In particular, claim 15, as now amended, defines a transceiver that includes, *inter alia*, "frequency error estimators for computing a frequency error estimate for each ray based on successive values of a respective one of the channel estimates; and at least two summers for performing weighted summations of groups of the frequency error estimates to provide at least two combined frequency error estimates, wherein: each of the combined frequency error estimates is a combined frequency error estimate of only those rays associated with a same one of the at least two base station transmitters, the one of the at least two base station transmitters being different for each of the combined frequency error estimates" (emphasis added).

Independent claim 30, as now amended, similarly defines a method that includes, *inter alia*, "performing at least two weighted summations of groups of the frequency error estimates to provide at least two combined frequency error estimates, wherein each of the combined frequency error estimates is a combined frequency error estimate of only those rays associated with a same one of the at least two base station transmitters, the one of the at least two base station transmitters being different for each of the combined frequency error estimates" (emphasis added).

Similarly, independent claim 73, as now amended, defines an apparatus that comprises, "frequency error estimators for estimating frequency errors separately for different signal paths; and combiners for combining groups of the frequency error estimates to produce at least two combined frequency error estimates, wherein each of the combined frequency error estimates is a combined frequency error estimate of only those rays associated with a same one of the two or more transmitters, the one of the two or more transmitters being different for each of the combined frequency error estimates" (emphasis added).

Independent claim 75, as now amended, similarly defines a method that comprises "estimating frequency errors separately for different signal paths; and combining groups of the frequency error estimates to produce at least two combined frequency error estimates,

wherein each of the combined frequency error estimates is a combined frequency error estimate of only those rays associated with a same one of the two or more transmitters, the one of the two or more transmitters being different for each of the combined frequency error estimates" (emphasis added).

Support for the amendments can be found in the specification at, for example, page 19, lines 9-22 and Figure 15A.

The Office acknowledges that Easton fails to disclose at least two summers for performing weighted summations of groups of the frequency error estimates to provide at least two combined frequency error estimates, wherein: each of the combined frequency error estimates corresponds to a respectively different one of at least two base station transmitters. The Office now relies on Sih as making up for these deficiencies.

This reliance is unfounded for at least the following reasons. Sih's arrangement provides a number of Rake fingers 700A-700N, each producing a respective error $e_1(n)$, ..., $e_N(n)$. Each of the error terms is supplied as an input to block 710, which produces therefrom a weighted average error term which, after further processing, is used to control the output frequency of a voltage controlled oscillator 740. Of relevance to this discussion is that *the weighted average is computed across all Rake fingers 700A-700N without regard to what transmitter those frequency error values are associated with; consequently, there is no mechanism for causing the weighted average to be representative of any one base station*.

To correct for frequency error due to Doppler, a respective one of a number of rotators 706A-706N is provided at the input of each finger 700A-700N to first rotate the IQ baseband samples prior to their being supplied to the fingers 700A-700N. The amount of rotation for each Rake finger is separately controlled by circuitry that pairs one of a number of summers 702A-702N with a respective one of a number of loop filters 704A-704N. Each summer 702A-702N subtracts its corresponding one of the error signals $e_1(n)$, ..., $e_N(n)$ from the weighted average. The result is then filtered by the loop filter 704A -704N, and the filtered signal controls the amount of rotation.

At no point in this process does the arrangement of Sih "provide at least two combined frequency error estimates, wherein: each of the combined frequency error estimates is a combined frequency error estimate of only those rays associated with a same one of the at least two base station transmitters, the one of the at least two base station transmitters being different for each of the combined frequency error estimates," as variously defined by Applicants' independent claims. Consequently, any combination of Sih with Easton would

similarly lack at least this feature, rendering such combination insufficient to support a *prima facie* case of obviousness.

In support of the rejection, the Office argues that "Sih disclose a RAKE receiver [that] comprises ... summers 702A-702N (at least two summers) for performing weighted summations (performing subtracting the frequency error of each finger from the weighted average, respectively, col. 6, lines 35-37) of groups of the frequency error estimates (frequency errors e(n)-e(n), col. 6, lines 35-37) to provide at least two combined frequency error estimates (to provide at least two combined frequency error estimates, each combined frequency error estimate provided by the difference between finger frequency error and the weighted average, col. 6, lines 35-37 and Fig. 7; note that the differences correspond to the combined frequency error estimates), wherein: each of the combined frequency error estimates (each of the difference between finger frequency error and the weighted average, col. 6, lines 35-37 corresponds to a respective different one of at least two base station transmitters (each frequency error corresponds to a different one of at least two base stations, col. 1, lines 56-65, col. 3, lines 14-62 and Fig. 4)."

As mentioned above, the Office explained its reasoning in its "Response to Arguments." Applicants understand the Office to be arguing that Sih's weighted average "corresponds to" a different one of at least two base stations because it is fed back to individual Rake fingers, each of which is associated with one base station.

It is respectfully asserted that the same reasoning no longer applies to the amended claims because regardless of how Sih uses the weighted average signal, that signal is not a "combined frequency error estimate of only those rays associated with *a same one* of the at least two base station transmitters." This is because the weighted average signal is computed across all Rake fingers, and therefore across all base stations. Even if one considers the respective outputs of Sih's summers 702A, ..., 702N, these outputs represent a weighted average across all base stations minus an error signal from just one of the base stations. Consequently, the outputs of the summers 702A, ..., 702N can still be based on frequency error estimates from more than one base station.

A key point in this regard is that *different paths from the same base station will have different Doppler shifts*. For this reason, Applicants' claimed embodiments combine frequency errors from *different paths of the same base station* to average out the Doppler shift due to path orientation so that the offset due to the transmitter remains. The prior art of

record fails to disclose or suggest this, and therefore cannot support a *prima facie* case of obviousness against Applicants' claimed embodiments.

In view of the foregoing, it is respectfully asserted that each of the independent claims 15, 30, 73, and 75, as well as their related dependent claims 74 and 76-82 are patentably distinguishable over the prior art of record. Accordingly, it is respectfully requested that the rejection of claims 15, 30, and 73-82 under 35 U.S.C. §103(a) be withdrawn.

The application is believed to be in condition for allowance. Prompt notice of same is respectfully requested.

Respectfully submitted,

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